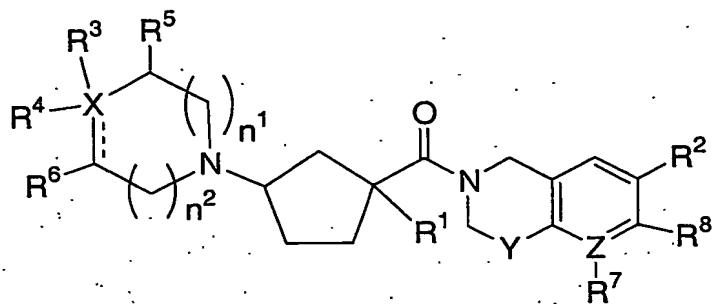


WHAT IS CLAIMED IS:

1. A compound represented by formula I:



I

5

or a pharmaceutically acceptable salt thereof, or an individual diastereomer thereof, wherein:

X is C, N, O or S;

Y is O, S, SO, SO₂, or NR⁹;

Z is C or N;

10 R¹ is hydrogen, -C₀₋₆alkyl-W-(C₁₋₆alkyl)-, -(C₀₋₆alkyl)-W-(C₀₋₆alkyl)-(C₃₋₇cycloalkyl)-(C₀₋₆alkyl), -(C₀₋₆alkyl)-W-phenyl, or -(C₀₋₆alkyl)-W-heterocycle, wherein the alkyl, phenyl, heterocycle and the cycloalkyl are optionally substituted with 1-7 independent halo, hydroxy, -O-C₁₋₃alkyl, trifluoromethyl, C₁₋₃alkyl, -O-C₁₋₃alkyl, -CO₂R¹⁰, -CN, -NR¹⁰R¹⁰, -NR¹⁰COR¹⁰, -NR¹⁰SO₂R¹¹, or -CONR¹⁰R¹⁰ substituents;

15 W is a single bond, -O-, -S-, -SO-, -SO₂-, -CO-, -CO₂-, -CONR¹⁰- or -NR⁹-;

R² is -halo, -C₀₋₆alkyl, C₀₋₆alkyl-W-C₁₋₆alkyl, C₀₋₆alkyl-W-C₃₋₇cycloalkyl, C₀₋₆alkyl-W-phenyl, or C₀₋₆alkyl-W-heterocycle, wherein the C₁₋₆alkyl, C₃₋₇cycloalkyl, phenyl and heterocycle optionally are independently substituted with 1-6 halo, trifluoromethyl, -CN, -C₁₋₆alkyl, or hydroxy substituents;

20 R³ is hydrogen, -(C₀₋₆alkyl)-phenyl, -(C₀₋₆alkyl)-heterocycle, -(C₀₋₆alkyl)-C₃₋₇cycloalkyl, -(C₀₋₆alkyl)-CO₂R¹⁰, -(C₀₋₆alkyl)-(alkene)-CO₂R¹⁰ (C₀₋₆alkyl)-SO₃H, -(C₀₋₆alkyl)-W-C₀₋₄alkyl, -(C₀₋₆alkyl)-CONR¹⁰-phenyl, or -(C₀₋₆alkyl)-CONR¹²-V-CO₂R¹⁰, and wherein R³ is nothing when X is O, and wherein C₀₋₆alkyl is optionally substituted with 1-5 independent halo, hydroxy, -C₀₋₆alkyl, -O-C₁₋₃alkyl, trifluoromethyl, or -C₀₋₂alkyl-phenyl substituents, and wherein the phenyl, heterocycle, cycloalkyl, and C₀₋₄alkyl is optionally substituted with 1-5 independent halo, trifluoromethyl, hydroxy, C₁₋₃alkyl, -O-C₁₋₃alkyl, -C₀₋₃-CO₂R¹⁰, -CN, -NR¹⁰R¹⁰, -CONR¹⁰R¹⁰, or -C₀₋₃-heterocycle substituents, and wherein the phenyl and heterocycle may be fused to another heterocycle, which itself optionally may be substituted with 1-2 independently hydroxy, halo, -CO₂R¹⁰,

or $-C_1\text{-}3\text{alkyl}$ substituents, and where alkene is optionally substituted with 1-3 independently halo, trifluoromethyl, $C_{1\text{-}3}\text{alkyl}$, phenyl, or heterocycle substituents;

V is $C_{1\text{-}6}\text{alkyl}$ or phenyl;

R^{12} is hydrogen, $C_{1\text{-}4}\text{alkyl}$, or R^{12} is joined via a 1-5 carbon tether to one of the carbons of

5 V to form a ring;

R^4 is nothing when X is either O, or N or when a double bond joins the carbons to which R^3 and R^6 are attached, or R^4 is hydroxy, $C_{1\text{-}6}\text{alkyl}$, $C_{1\text{-}6}\text{alkyl-hydroxy}$, $-O\text{-}C_{1\text{-}3}\text{alkyl}$, $-CO_2R^{10}$, $-CONR^{10}R^{10}$, or $-CN$;

or R^3 and R^4 are joined together to form a 1H-indenyl, 2,3-dihydro-1H-indenyl, 2,3-

10 dihydro-benzofuranyl, 1,3-dihydro-isobenzofuranyl, 2,3-dihydro-benzothiofuranyl, 1,3-dihydro-isobenzothiofuranyl, 6H-cyclopenta[d]isoxazol-3-olyl, cyclopentanyl, or cyclohexanyl ring, wherein the ring formed optionally is substituted with 1-5 independently halo, trifluoromethyl, hydroxy, $C_{1\text{-}3}\text{alkyl}$, $-O\text{-}C_{1\text{-}3}\text{alkyl}$, $-C_{0\text{-}3}\text{-}CO_2R^{10}$, $-CN$, $-NR^{10}R^{10}$, $-CONR^{10}R^{10}$, or $-C_{0\text{-}3}\text{-heterocyclyl}$ substituents;

or R^3 and R^5 or R^4 and R^6 are joined together to form a phenyl or heterocyclyl ring,

15 wherein the ring is optionally substituted with 1-7 independent halo, trifluoromethyl, hydroxy, $C_{1\text{-}3}\text{alkyl}$, $-O\text{-}C_{1\text{-}3}\text{alkyl}$, $-CO_2R^{10}$, $-CN$, $-NR^{10}R^{10}$, or $-CONR^{10}R^{10}$ substituents;

R^5 and R^6 are independently hydrogen, hydroxy, $C_{1\text{-}6}\text{alkyl}$, $C_{1\text{-}6}\text{alkyl-}CO_2R^{10}$, $C_{1\text{-}6}\text{alkyl-hydroxy}$, $-O\text{-}C_{1\text{-}3}\text{alkyl}$, or halo, or $=O$, when R^5 or R^6 is connected to the ring via a double bond; when $Z = C$, R^7 is hydrogen, hydroxy, halo, $C_{1\text{-}6}\text{alkyl}$ optionally substituted with 1-6

20 fluro, $-O\text{-}C_{1\text{-}6}\text{alkyl}$ optionally substituted with 1-6 fluro, $-NR^{10}R^{10}$, $-NR^{10}CO_2R^{11}$, $-NR^{10}CONR^{10}R^{10}$, $-NR^{10}\text{-}SO_2\text{-}NR^{10}R^{10}$, $-NR^{10}\text{-}SO_2\text{-}R^{11}$, heterocycle, $-CN$, $-CONR^{10}R^{10}$, $-CO_2R^{10}$, $-NO_2$, $-S\text{-}R^{10}$, $-SO\text{-}R^{11}$, $-SO_2\text{-}R^{11}$, or $-SO_2\text{-}NR^{11}R^{11}$;

when $Z = N$, R^7 is nothing or oxide (resulting in a pyridine N-oxide);

R^8 is hydrogen, $C_{1\text{-}6}\text{alkyl}$, trifluoromethyl, trifluoromethoxy, chloro, fluoro, bromo, or

25 phenyl;

R^9 is SO_2R^{11} , COR^{10} , $CONHR^{10}$, CO_2R^{11} , or SO_2NHR^{10} ;

R^{10} is hydrogen, $-C_{1\text{-}6}$ alkyl, benzyl, phenyl, or $-C_{0\text{-}6}$ alkyl- $C_{3\text{-}6}$ cycloalkyl, optionally substituted with 1-3 independent halo, $C_{1\text{-}3}\text{alkyl}$, $C_{1\text{-}3}\text{alkoxy}$ or trifluoromethyl substituents;

R^{11} is $C_{1\text{-}6}\text{alkyl}$, $-C_{0\text{-}6}\text{alkyl-}C_{3\text{-}6}\text{cycloalkyl}$, benzyl or phenyl, optionally substituted

30 with 1-3 independent halo, $C_{1\text{-}3}\text{alkyl}$, $C_{1\text{-}3}\text{alkoxy}$ or trifluoromethyl substitutents;

n^1 and n^2 are independently 0, 1 or 2, wherein the sum of n^1 and n^2 is 0, 1, 2, or 3; and the dashed line represents a single or a double bond.

2. The compound of Claim 1, wherein X is C.

3. The compound of Claim 1, wherein X is O.

4. The compound of Claim 1, wherein X is N.

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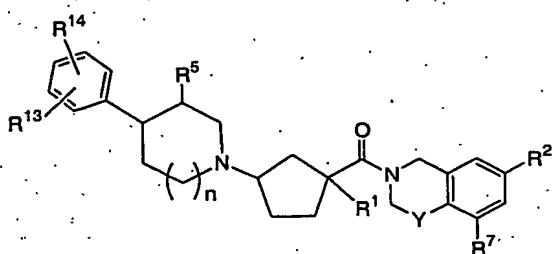
5. The compound of Claim 1, wherein

10 R^3 and R^4 are joined together to form a 1H-indenyl, 2,3-dihydro-1H-indenyl, 2,3-dihydro-benzofuranyl, 1,3-dihydro-isobenzofuranyl, 2,3-dihydro-benzothiofuranyl, 1,3-dihydro-isobenzothiofuranyl, 6H-cyclopenta[d]isoxazol-3-olyl, cyclopentanyl, or cyclohexanyl ring, wherein the ring formed optionally is substituted with 1-5 independently halo, trifluoromethyl, hydroxy, C_1 -3alkyl, -O- C_1 -3alkyl, - C_{0-3} -CO₂R¹⁰, -CN, -NR¹⁰R¹⁰, -CONR¹⁰R¹⁰, or - C_{0-3} -heterocyclyl substituents;

15 or R^3 and R^5 or R^4 and R^6 are joined together to form a phenyl or heterocyclyl ring, wherein the ring is optionally substituted with 1-7 independent halo, trifluoromethyl, hydroxy, C_1 -3alkyl, -O- C_1 -3alkyl, -CO₂R¹⁰, -CN, -NR¹⁰R¹⁰, or -CONR¹⁰R¹⁰ substituents.

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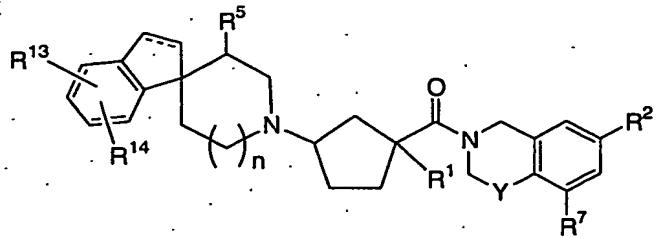
6. The compound of Claim 1, represented by formula Ia:



(Ia)

or pharmaceutically acceptable salts and individual diastereomers thereof, wherein R^1 ,
20 R^2 , R^5 , R^7 , and Y are defined as in Claim 1;
wherein R^{13} and R^{14} are independently hydrogen, halo, trifluoromethyl, hydroxy, - C_1 -3alkyl, -O- C_1 -3alkyl, - C_{0-3} -CO₂H, - C_{0-3} -CO₂C₁-3alkyl, -CN, or - C_{0-3} -heterocycle;
or R^{13} and R^{14} are joined together to form a heterocycle which is fused to the phenyl ring,
and which itself may be unsubstituted or substituted with 1-2 independent hydroxy, halo, -CO₂R¹⁰, or -
25 C_1 -3alkyl substituents; and
n is 0, 1, or 2.

7. The compound of Claim 1, represented by formula Ib:



(Ib)

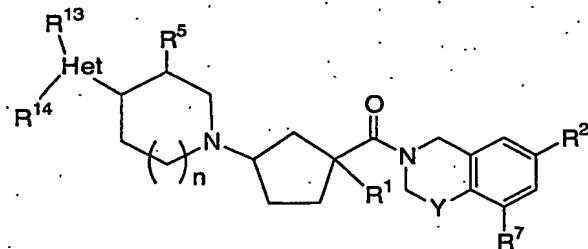
or pharmaceutically acceptable salts and individual diastereomers thereof, wherein R¹, R², R⁵, R⁷, and Y are defined as in Claim 1;

5 R¹³ and R¹⁴ are independently hydrogen, halo, trifluoromethyl, hydroxy, -C₁₋₃alkyl, -O-C₁₋₃alkyl, -C₀₋₃-CO₂H, -C₀₋₃-CO₂C₁₋₃alkyl, -CN, or -C₀₋₃-heterocycle;

or R¹³ and R¹⁴ are joined together to form a heterocycle which is fused to the phenyl ring, and which itself may be unsubstituted or substituted with 1-2 independent hydroxy, halo, -CO₂R¹⁰, or -C₁₋₃alkyl substituents; and

10 n is 0, 1, or 2.

8. The compound of Claim 1, represented by formula Ic:



(Ic)

15 or pharmaceutically acceptable salts and individual diastereomers thereof, wherein R¹, R², R⁵, R⁷, and Y are defined as in Claim 1;

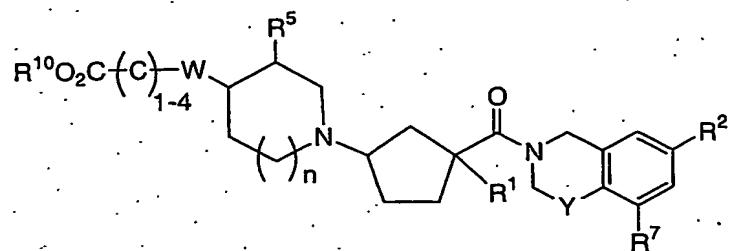
wherein R¹³ and R¹⁴ are independently hydrogen, halo, trifluoromethyl, hydroxy, -C₁₋₃alkyl, -O-C₁₋₃alkyl, -C₀₋₃-CO₂H, -C₀₋₃-CO₂C₁₋₃alkyl, -CN, or -C₀₋₃-heterocycle;

or R¹³ and R¹⁴ are joined together to form a heterocycle which is fused to the phenyl ring, and which itself may be unsubstituted or substituted with 1-2 independent hydroxy, halo, -CO₂R¹⁰, or -C₁₋₃alkyl substituents;

n is 0, 1, or 2; and

Het is a heterocycle.

9. The compound of Claim 1, represented by formula Id:



(Id)

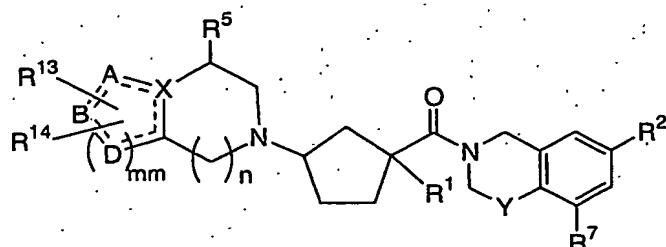
5 or pharmaceutically acceptable salts and individual diastereomers thereof, wherein R¹, R², R⁵, R⁷, R¹⁰, Y, and W are as defined in Claim 1;

n is 0, 1, or 2; and

C₁₋₄ carbon chain is optionally substituted with 1-4 independent halo, hydroxy, -C₀₋₆alkyl, -O-C₁₋₃alkyl, trifluoromethyl, or -C₀₋₂alkyl-phenyl substituents; or the C₁₋₄ carbon chain is part of

10 a C₃₋₇cycloalkyl ring.

10. The compound of Claim 1, represented by formula Ie:



(Ie)

15 or pharmaceutically acceptable salts and individual diastereomers thereof, wherein R¹, R², R⁵, R⁷, R¹³, R¹⁴, X, and Y are as defined in Claim 1;

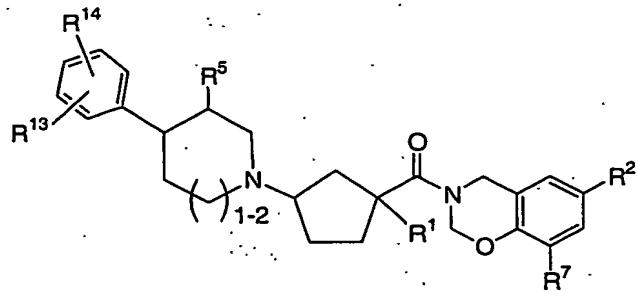
n is 0, 1, or 2;

the dotted lines represent an optional bond;

mm is 1 or 2, and

20 A, B, and D are each independently C, N, O, or S; or A, B, and D, in combination with mm = 2, form a phenyl ring; or in combination form a heterocycle when at least one of X, A, B, D is N, O, or S.

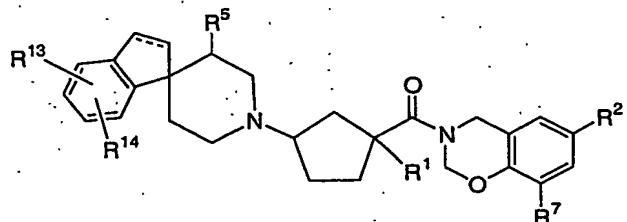
11. The compound of Claim 1, represented by formula If:



(If)

or pharmaceutically acceptable salts and individual diastereomers thereof, wherein R¹, R², R⁵, R⁷, R¹³, and R¹⁴, are as defined for Claim 1;
 5 or wherein R¹³ and R¹⁴ are joined together to form a heterocycle fused to the phenyl ring, and wherein the heterocycle is itself is optionally substituted with 1-2 independent hydroxy, halo, -CO₂R¹⁰, or -C₁₋₃alkyl substituents.

10 12. The compound of Claim 1, represented by formula Ig:

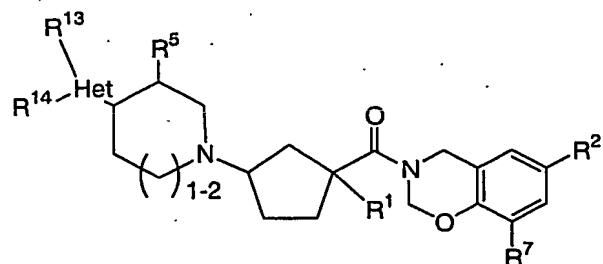


(Ig)

or pharmaceutically acceptable salts and individual diastereomers thereof, wherein the dashed line represents an optional bond and R¹, R², R⁵, R⁷, R¹³, and R¹⁴ are as defined in Claim 1.

15

13. The compound of Claim 1, represented by formula Ih:



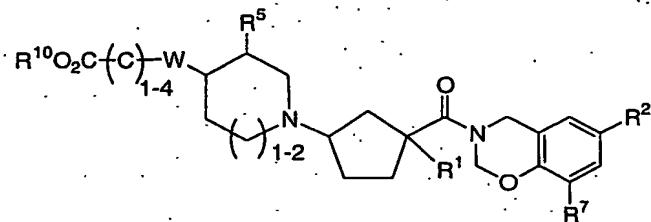
(Ih)

or pharmaceutically acceptable salts and individual diastereomers thereof, wherein R¹, R², R⁵, R⁷, R¹³, and R¹⁴ are as defined in Claim 1; and

Het is a heterocycle.

5

14. The compound of Claim 1, represented by formula II:

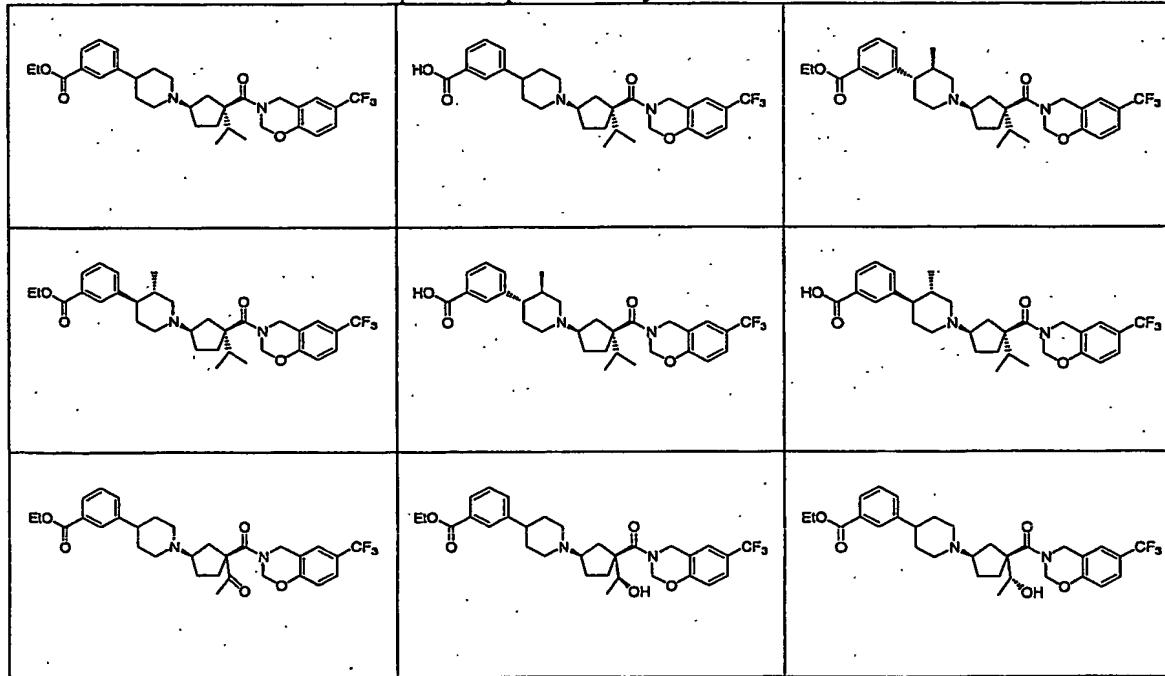


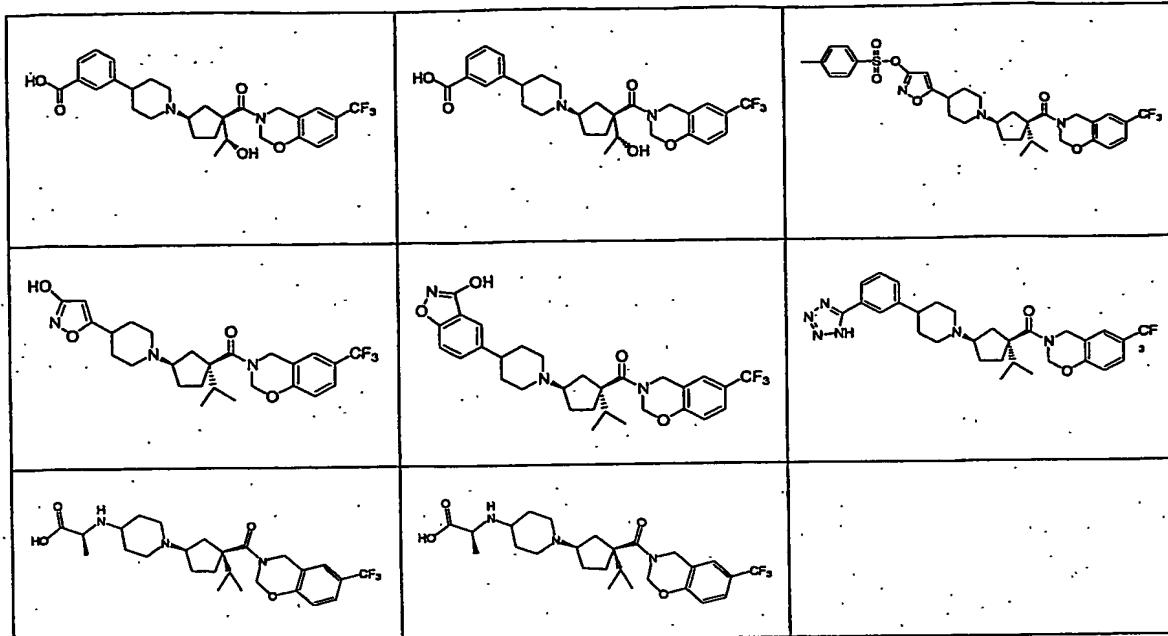
(II)

or pharmaceutically acceptable salts and individual diastereomers thereof, wherein R¹, R², R⁵, R⁷, R¹⁰, and W are defined as in Claim 1; and

wherein the C₁₋₄ carbon chain is optionally substituted with 1-4 independent halo, hydroxy, -C₀₋₆alkyl, -O-C₁₋₃alkyl, trifluoromethyl, or -C₀₋₂alkyl-phenyl substituents.

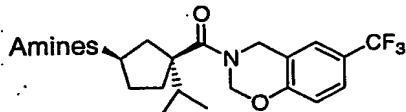
15. A compound represented by



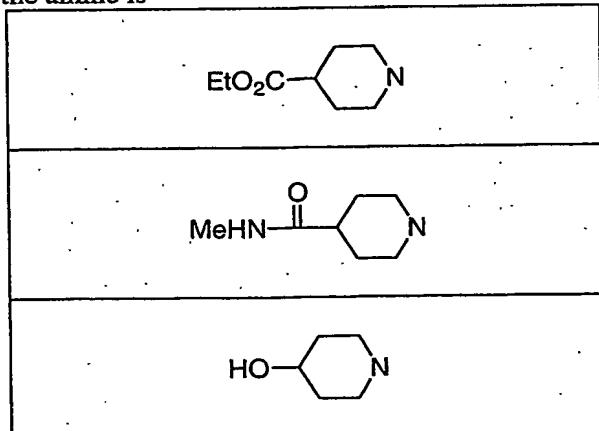


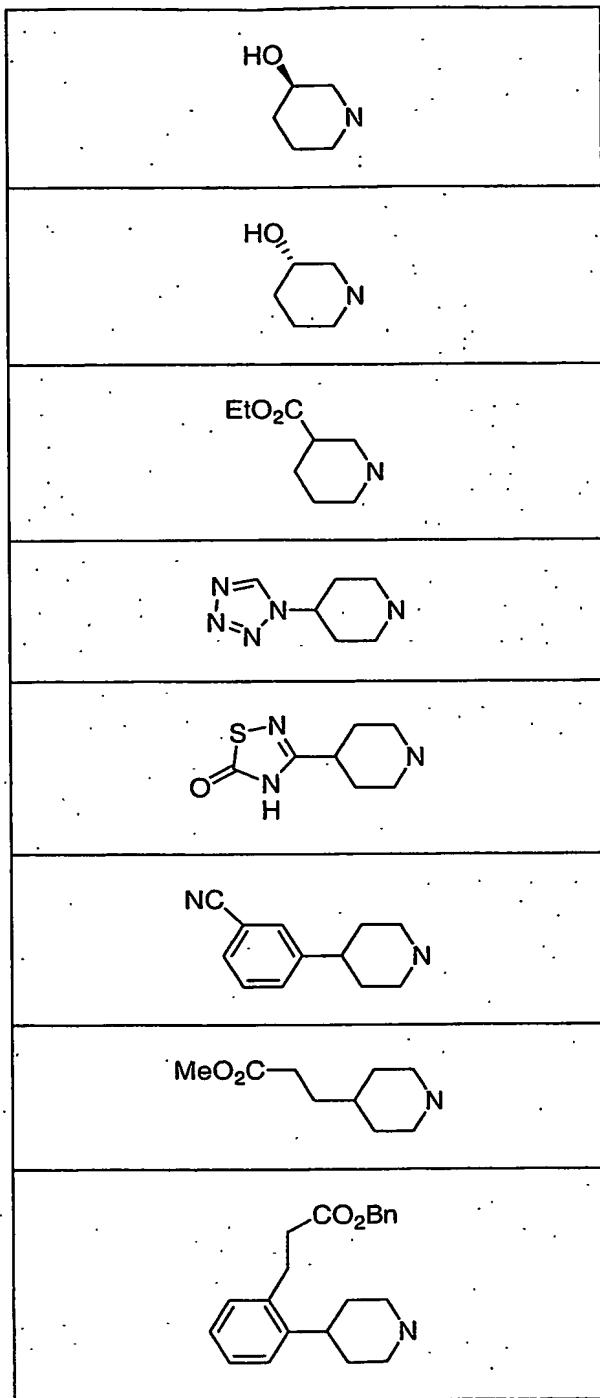
or a pharmaceutically acceptable salt or individual diastereomer thereof.

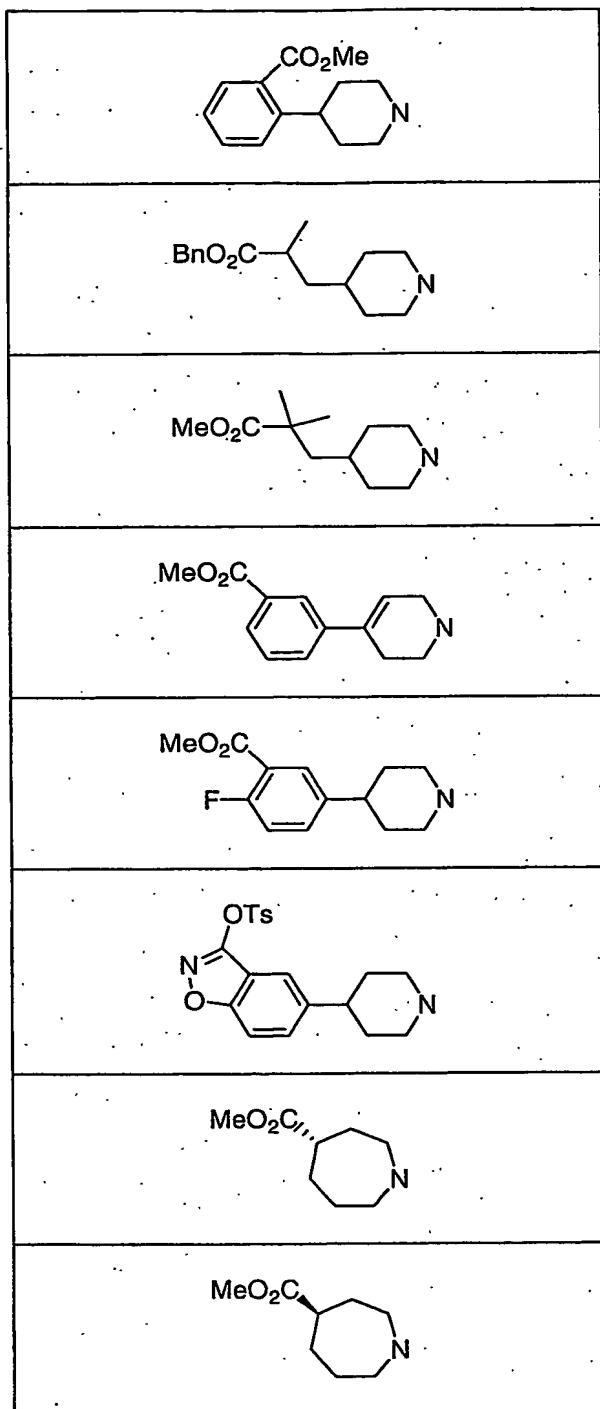
16. A compound represented by

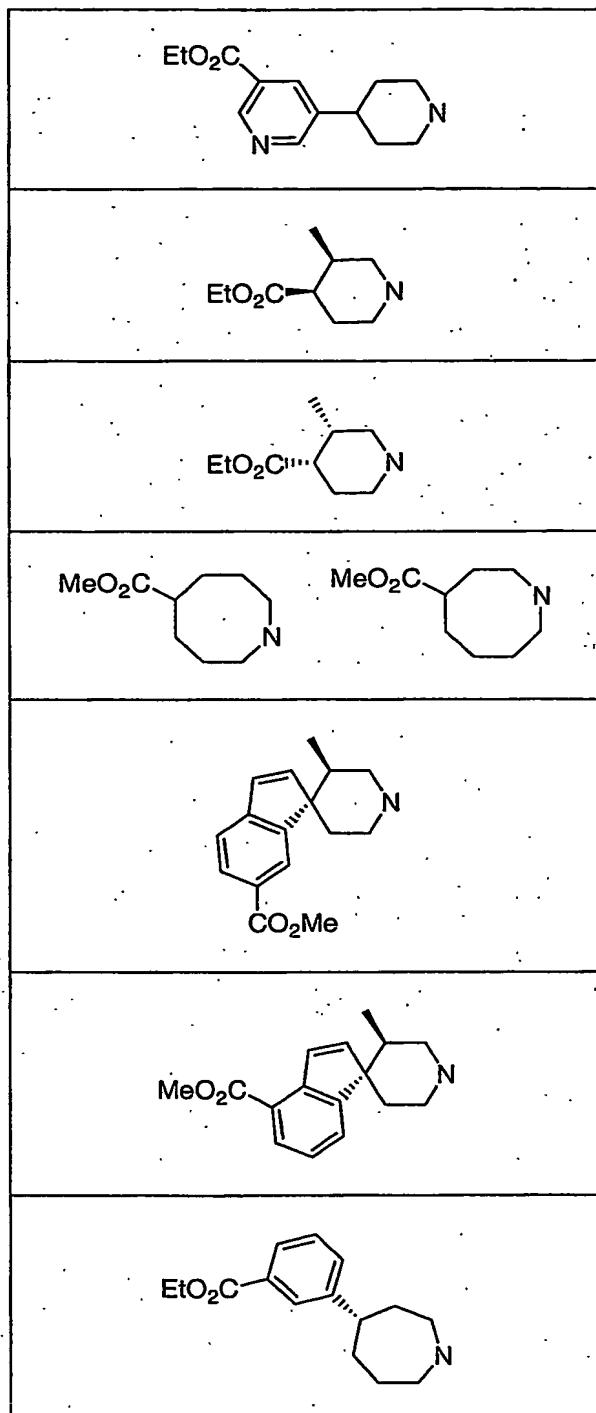


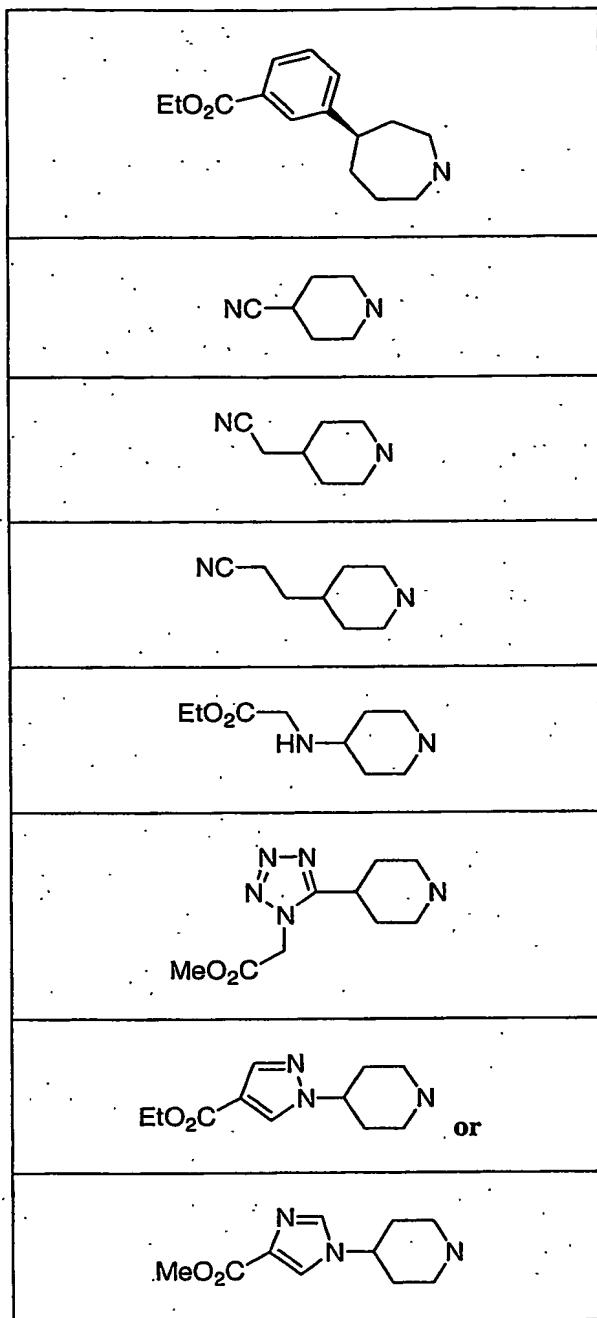
5 wherein the amine is





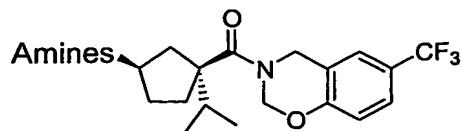




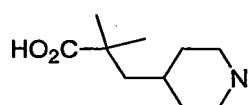
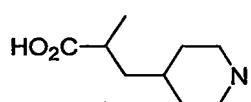
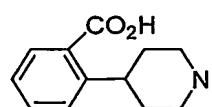
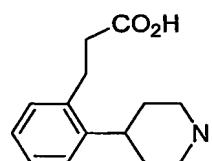
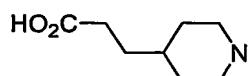
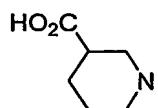
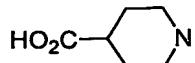


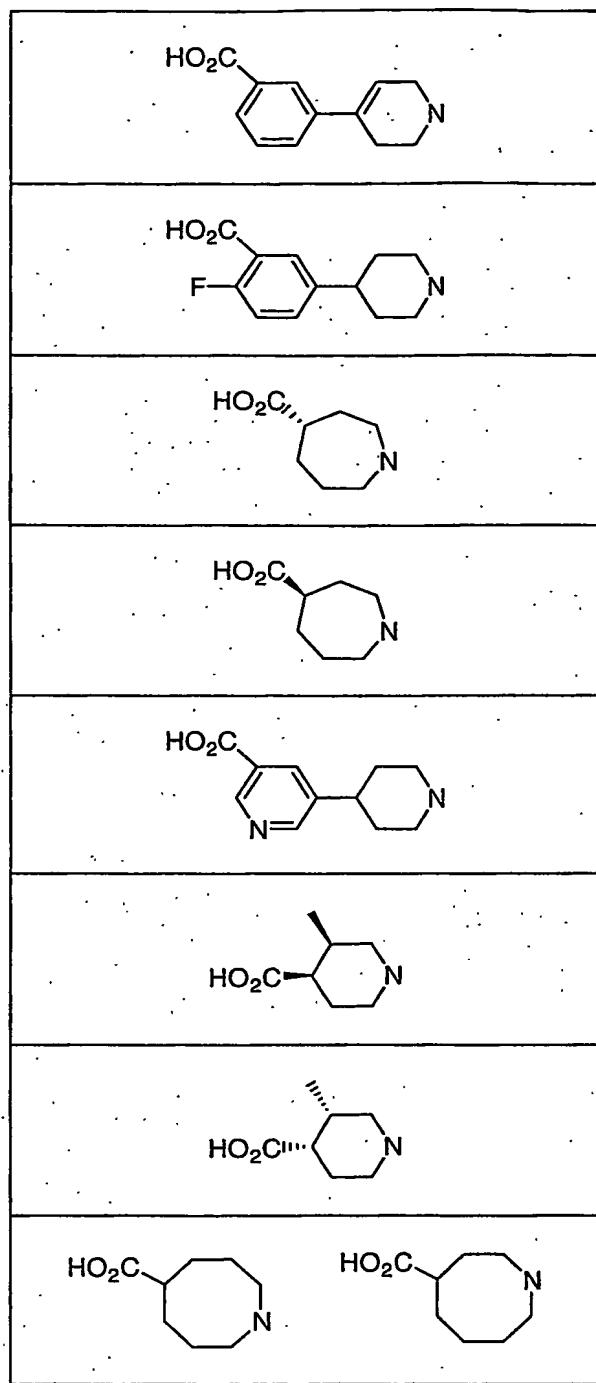
or a pharmaceutically acceptable salt or individual diastereomer thereof.

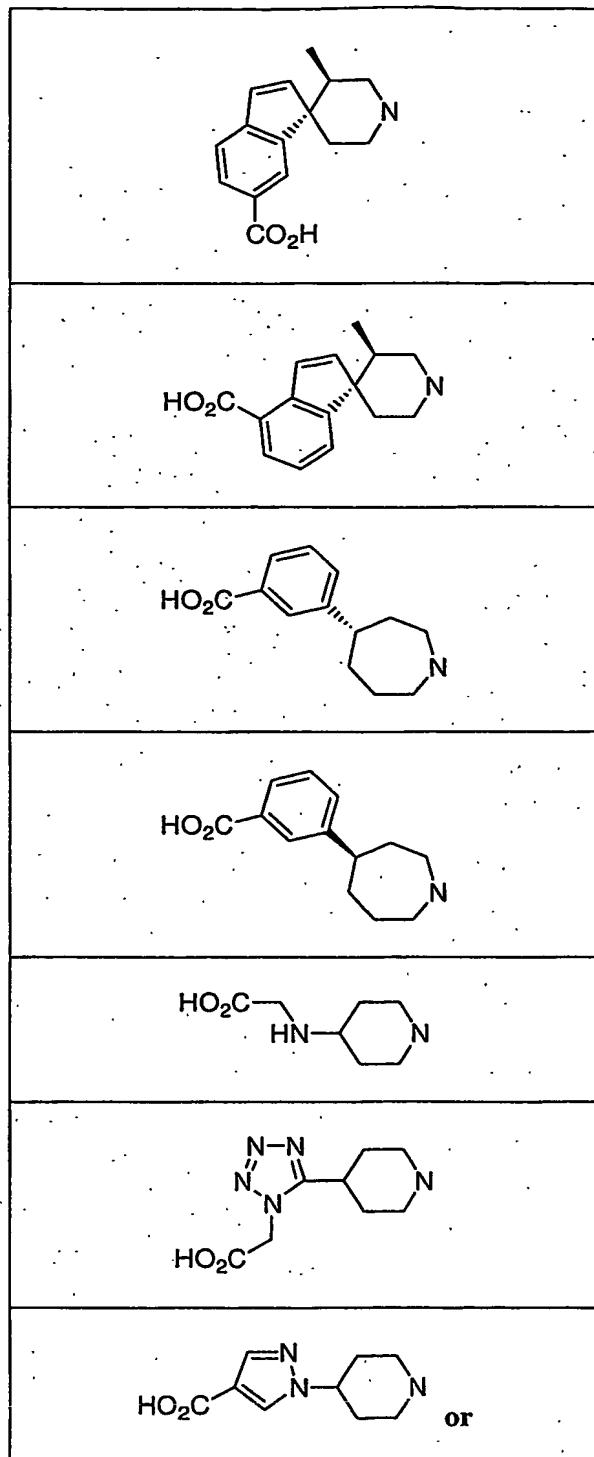
17. A compound represented by

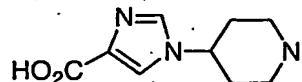


wherein amine is



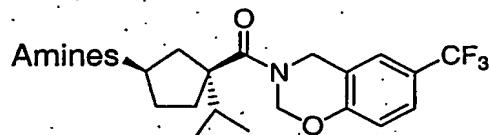




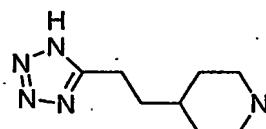
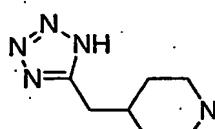
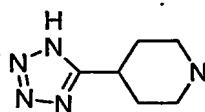


or a pharmaceutically acceptable salt or individual diastereomer thereof.

18. A compound represented by

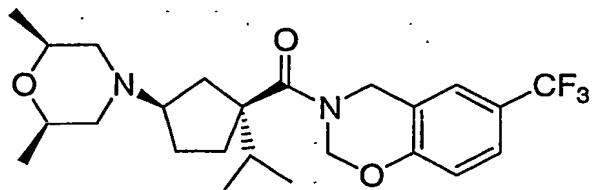


5 wherein amine is



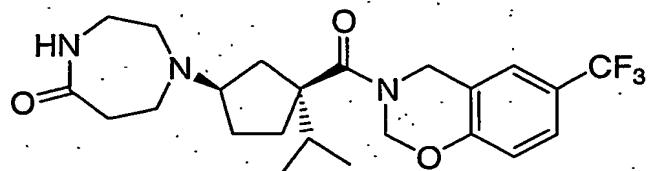
or a pharmaceutically acceptable salt or individual diastereomer thereof.

19. A compound represented by



10 or a pharmaceutically acceptable salt or individual diastereomer thereof.

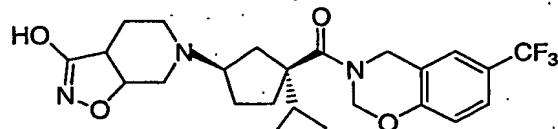
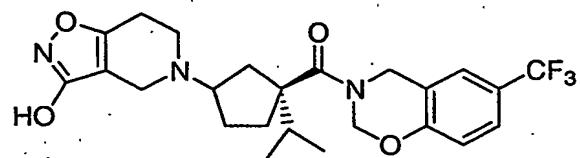
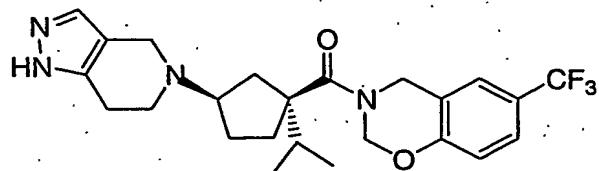
20. A compound represented by



or a pharmaceutically acceptable salt or individual diastereomer thereof.

5

21. A compound represented by



10

or a pharmaceutically acceptable salt or individual diastereomer thereof.

22. A pharmaceutical composition which comprises an inert carrier and a compound of Claim 1.

15

23. A method for modulation of chemokine receptor activity in a mammal which comprises the administration of an effective amount of the compound of Claim 1.

24. A method for treating, ameliorating, controlling or reducing the risk of an inflammatory and immunoregulatory disorder or disease which comprises the administration to a patient of an effective amount of the compound of Claim 1.

5 25. A method for treating, ameliorating, controlling or reducing the risk of rheumatoid arthritis which comprises the administration to a patient of an effective amount of the compound of Claim 1.